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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/565,878

Applicant(s)

FROHLICH ET AL.

Examiner

STEPHEN A. BRAY

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

DETAILED ACTION

In an amendment dated, 11/14/2009, the Applicant amended claim 1. Currently claims 1-12 are pending.

Response to Arguments

1. Applicant's arguments filed 11/04/2009 have been fully considered but they are not persuasive.
2. Regarding the Applicant's argument on the first paragraph of Page 6-7, that *Armstrong* (US 5,565,891) and *Nippoldt* (US 4,952,919) fail to teach the subject matter of Claim 1, the Examiner respectfully disagrees.

Regarding the assertion that the control device taught by *Armstrong* has difficulties registering displacement data along the z-axis, the Examiner respectfully argues that Claim 1 of the applicant's disclosure doesn't specify that the retainer element has to move in the z-axis direction. Claim 1 of the applicant's disclosure states that "...the retainer element may be displaced in at least two mutually perpendicular directions;". Therefore, using the broadest reasonable interpretation of the claim, the above section of Claim 1 can be defined as displacing the retainer element along the x-axis and the y-axis, without any displacement along the z-axis. As shown in Figure 4 and discussed in Column 6, lines 36-41, the input device taught by *Armstrong* would have no trouble being displaced in the x-direction and the y-direction using the trackball 12.

In response to Applicant's argument that the Examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Figures 3-4 of *Armstrong* disclose that the portion of trackball 12 exposed for manipulation by the user is less than half the surface area of the trackball. Column 6, lines 36-41 of *Armstrong* discloses that the trackball 12 can be grasped and used to move the carriage 14 in any linear direction. Column 1, lines 30-53 of *Nippoldt* discloses that by having a limited surface area of the trackball exposed, fine rotational movements of the trackball are difficult to perform. By modifying the input device taught by *Armstrong* with the trackball mechanism taught by *Nippoldt*, an input device could be formed which contains a trackball mechanism which would allow a user to perform trackball inputs with greater precision. The modified input device taught by *Armstrong* and *Nippoldt* would allow the user to grasp the trackball on two diametrically opposed sphere segment sections and allow the user to exert displacement forces, as well as rotational forces, using the operating ball.

3. Regarding the Applicant's argument on the first paragraph of Page 9, that *Bruneau* (US 6,707,443) and *Nippoldt* (US 4,952,919) fail to teach the subject matter of Claim 10, the Examiner respectfully disagrees. Since the prior art invention being

modified is the modified input device taught by *Armstrong* and *Nippoldt*, the question is not whether *Nippoldt* would render *Bruneau* unsatisfactory for its intended purpose, it would be whether *Bruneau* renders *Nippoldt* unsatisfactory for its intended purpose.

The Examiner asserts that by using optical sensors to detect the rotational movement of a trackball as taught by *Bruneau* instead of using encoder type sensors to detect the rotational movement of a trackball as taught by *Nippoldt*, the modified input device would still operate in the same manner and perform its intended purpose of detecting the rotational trackball inputs made to the modified input device by the user.

4. Regarding the Applicant's argument on the second to last paragraph of Page 9, that *Keyson* (US 5,784,052) fails to teach the subject matter of Claim 11, specifically having "...*additional actuators which oppose or reinforce a varying force in reaction to control signals from the user resulting from displacement of the retainer element or rotation of the operating ball*", the Examiner respectfully disagrees. Section 2111 of the MPEP states that "During patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification."" Paragraph [0018] of the Applicant's specification discloses that "...*An advantageous embodiment thus distinguishes itself in that actuators are provided that exert a certain opposing force in reaction to control signals of the displacement of the retainer element and/or of the rotation of the operating ball.*" By giving the claim language its broadest reasonable interpretation, the Examiner can understand Claim 11 to read that the actuators generate a force in reaction to the displacement of the retainer element OR rotation of the operating ball. Figure 2 and Column 5, lines 48-63 and Column 6, lines 26-60 of

Keyson disclose that sensor means 110 and 114 detect the user movement of a rotatable member 108 and send that to a PC 102. PC 102 then generates control signals that are sent to a first drive means 116 and a second drive means 120, where the drive means comprise electric DC motors, said control signals cause the first and second drive means to positive and/or negative torques to rotatable member 108 being operated by the user to provide tactile feedback to the user. Therefore *Keyson* does teach the subject matter of Claim 11, mainly an input device containing additional actuators which oppose or reinforce a force in reaction to control signals inputted by the user through rotation of the operating ball.

5. Applicant's arguments, see the last two paragraphs of Page 8, filed 11/04/2009, with respect to the rejection(s) of claim(s) 5 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of *Armstrong* (US 5,565,891), *Nippoldt* (US 4,952,919), *Blonder* (US 5,620,371) and *Toyoda et al* (US 5,371,516). The Examiner agrees with the Applicant's arguments that *Blonder* doesn't explicitly teach securing a trackball to a control device using a magnet. However Figure 17B and Column 11, lines 3-25 of *Toyoda et al* disclose having a computer input device wherein a ball 8 is held in place in the input device using a magnet 49, said ball 8 having a core 50 consisting of a magnetic body surrounded by a non-magnetic material 51. Therefore it would have been obvious to one of ordinary skill in the art at the time that the invention was made that the operating ball taught by *Blonder* could be combined with the teachings of *Toyoda et al* in order to form an operating ball which is

magnetically held in place in a computer input device. Said magnetically secured operating ball could then be used in the input device taught by *Armstrong* and *Nippoldt* to form an input device in which the operating ball can be used to display advertisements to the user. Since the Applicant introduced new subject matter into Claim 1, specifically the limitation "*and wherein the operating ball and retaining element are displaceable*", and Claim 5 is dependent upon Claim 1, the scope of Claim 5 has been changed and the Examiner is able to make the rejections FINAL.

Claim Objections

6. Claim 11 recites the limitation "*Data registration device per Claim 1, further comprising additional actuators...*" in Lines 1-2 of Claim 11. There is insufficient antecedent basis for this limitation in the claim. There is no mention in Claim 1 of having any actuators in the data registration device.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear to the Examiner whether the limitation "...*and wherein the operating ball and retaining element are displaceable*..." refers to both the operating ball and the

retaining element being separately displaceable or whether a displacement force applied to the operating ball causes the retaining element to be displaced. The Examiner will examine the claims under the assumption that a displacement force applied to the operating ball will cause the retaining element to be displaced.

9. Claims 2-12 are rejected as being dependent upon a rejected base claim.

Claim Rejections - 35 USC § 103

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1-4, 6-9, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Armstrong (US 5,565,891) in view of Nippoldt (US 4,952,919).

Regarding claim 1, *Armstrong* discloses a data registration device for data processing systems, particularly for the determination of multi-dimensional coordinates created by means of exertion of displacement and/or rotational forces (See abstract.), comprising

- a stand (Figure 2 discloses a housing 10.);

- a retainer element mounted in the stand such that the retainer element may be displaced in at least two mutually perpendicular directions (Figure 2 and Column 5, lines 38-52 disclose a carriage 14, which is movable left and right, forward and rearward, and up and down. However, by giving the claim its broadest reasonable interpretation, *Armstrong* only has to meet two of the three conditions listed above, i.e. left and right, forward and rearward.);

- an operating ball that may be rotated through three axes but not displaced within the retainer element (Figure 2 discloses a trackball 12 which is mounted within carriage 14.);

- at least one sensor to determine the displacement of the retainer element and the rotation of the operating ball (Figure 2 and Column 7, lines 48-53 disclose sensors 124, 126, and 128 for determining movement of the trackball and sensors 102, 106, 108, and 114 for determining movement of the carriage 14.);

- an interface unit that transmits data delivered from the sensors to a connected data processing system (Column 11, lines 42-56 discloses having circuitry for transmitting the data collected by the sensors to a connected host device.);

and wherein the operating ball and retaining element are displaceable (Figure 3 and Column 6, lines 36-41 of *Armstrong* disclose that by applying a force to trackball 12, carriage 14 can be moved in any linear direction.), and

wherein the displacement forces and the rotation forces with respect to all axes may be exerted by means of the operating ball (Column 6, lines 36-41 of *Armstrong* discloses that trackball 12 can be grasped by the fingers of the hand and used to move

carriage 14 in any linear direction. Column 7, lines 48-53 of *Armstrong* also discloses that trackball 12 would also be used to exert rotational forces.).

Armstrong fails to teach wherein the operating ball is mounted within the retaining element such that it may be grasped on two at least partially diametrically opposed sphere segment sections.

Nippoldt discloses wherein the operating ball is mounted within the retaining element such that it may be grasped on two at least partially diametrically opposed sphere segment sections (Figure 1 and Column 6, lines 4-15 disclose having ball 80 of an input device 10 mounted in such a way to allow the user to grab two diametrically opposed sections 166 and 168 of the ball 80 between finger 170 and thumb 172.).

Therefore it would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the input device taught by *Armstrong* with the teachings of *Nippoldt* in order to form an input device in which the user can precisely control the rotation of the operating ball.

Regarding claim 2, *Armstrong* as modified above discloses a data registration device per Claim 1, wherein the retainer element may be simultaneously displaced in the direction of several displacement axes, and wherein the operating ball may be rotated simultaneously about several axes (Figure 2 and Column 6, lines 36-41 of *Armstrong* disclose that carriage 14 and trackball 12 can be moved in any direction desired.).

Regarding claim 3, *Armstrong* as modified above discloses a data registration device per Claim 1 wherein the retainer element possesses a frame-shaped ball mount

that surrounds the operating ball along a great circle in a surrounded section greater than π (Figure 2, Figure 4, and Column 6, lines 27-34 of *Armstrong* disclose that trackball 12 is placed in an opening 26, and secured in place by a collet 16, which encircles trackball 12.).

Regarding claim 4, *Armstrong* as modified above discloses a data registration device per Claim 1 wherein the retainer element includes a key-shaped ball mount (Figure 3 and Column 3, lines 28-32 of *Nippoldt* disclose a ring bearing 70 which is beveled to slope downward and inward to receive and support the trackball 80.).

Regarding claim 6, *Armstrong* as modified above discloses a data registration device per Claim 3, wherein the retainer element includes the ball mount, an inner frame, and an outer frame, wherein the ball mount is mounted within the inner frame which itself is mounted in the outer frame such as to be displaceable along a first direction, which in turn is mounted in the stand such as to be displaceable along a second direction perpendicular to the first direction, and wherein at least one of the components of the retainer element is displaceable along a third direction that is perpendicular to the first and the second direction (Figure 2 and Column 5, lines 38-43 of *Armstrong* disclose that carriage 14 is displaceable in at least three directions that are perpendicular to each other, i.e. up/down, left/right, and forward/rearward. Figures 2-4 and Column 9, lines 39-47 of *Armstrong* disclose that carriage 14 has an opening 26 in which trackball 12 resides. Carriage 14 is mounted in track frame 34, and is moveable in a first direction, but not a second direction with respect to track frame 34. Track frame 34 is moveable in the second direction, which is perpendicular to said first

direction. Track frame 34 is also moveable in the up/down direction, which is perpendicular to the first two directions.).

Regarding claim 7, *Armstrong* as modified above discloses a data registration device per Claim 1, further comprising return elements that return the retainer element or its components to a rest position when no displacement force is being exerted (Figure 2 of *Armstrong* discloses having foam rubber 30, which is used to return carriage 14 to a rest position when no force is being exerted on the carriage 14.).

Regarding claim 8, *Armstrong* as modified above discloses a data registration device per Claim 1, wherein displacement of the retainer element is registered by path, force, or acceleration sensors (Figure 2 and Column 6, lines 1-13 of *Armstrong* disclose having two-piece proximity sensor sets, i.e. actuator 100 and sensor 102, which are used to determine the direction in which carriage 14 is being displaced.).

Regarding claim 9, *Armstrong* as modified above discloses a data registration device per Claim 1, further comprising at least two motion sensors positioned within the retainer element that register the rotation of the operating ball about three mutually-perpendicular axes (Figure 2 and Column 7, lines 11-19 of *Armstrong* disclose having encoders (sensors) 124, 126, 128 which detect rotation of the trackball 12. Figure 1 and Column 5, lines 1-4 of *Nippoldt* disclose that motion sensors 46, 48, and 50, which are preferably of an encoder-type, are used to register rotation of the ball 80.).

Regarding claim 12, *Armstrong* as modified above discloses a data registration device per Claim 1, further comprising additional switches that transmit additional control signals to the data processing system upon actuation (Figure 1 of *Nippoldt*

discloses a trackball device with switches 94 for transmitting additional control signals upon actuation. Figure 8 of *Armstrong* also discloses an input device having switches 144 and 146.).

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Armstrong* (US 5,565,891) and *Nippoldt* (US 4,952,919) as applied to claim 4 above, and further in view of *Blonder* (US 5,620,371) and *Toyoda et al* (US 5,371,516).

Regarding claim 5, *Armstrong* as modified above discloses a data registration device per Claim 4.

Armstrong as modified above fails to teach a data registration device wherein the operating ball is mounted magnetically within the key-shaped ball mount, wherein the operating ball is hollow and is made of a non-magnetic material, wherein a magnetizable retaining ball is mounted within the operating ball so that it may move freely, and wherein a magnetic field source positioned outside the operating ball attracts the retaining ball into the key-shaped ball mount, and wherein the operating ball is mounted in the ball mount such so that it may rotate.

Blonder discloses wherein the operating ball is hollow and is made of a non-magnetic material, wherein a magnetizable retaining ball is mounted within the operating ball so that it may move freely, and wherein a magnetic field source positioned outside the operating ball attracts the retaining ball into the key-shaped ball mount, and wherein the operating ball is mounted in the ball mount such so that it may

rotate (Figure 4 discloses a trackball 13 which is made up of an outer sphere 131, which is made of plastic, and an inner sphere 132, which contains a magnet 145. The input device contains a second magnet 146 which attracts the magnet 145 located in the trackball 13, holding the inner sphere 132 in a desired position while the outer sphere 131 is able to rotate freely.).

Blonder fails to teach a data registration device wherein the operating ball is mounted magnetically within the key-shaped ball mount.

Toyoda et al discloses a data registration device wherein the operating ball is mounted magnetically within the key-shaped ball mount (Figure 17B and Column 11, lines 3-25 of *Toyoda et al* disclose having a computer input device wherein a ball 8 is held in place in the input device using a magnet 49, said ball 8 having a magnetic core 50 surrounded by a non-magnetic material 51.).

Therefore it would have been obvious to one of ordinary skill in the art at the time that the invention was made that the operating ball taught by *Blonder* could be combined with the teachings of *Toyoda et al* in order to form an operating ball which is magnetically held in place in a computer input device.

Therefore it would have been obvious to one of ordinary skill in the art at the time that the invention was made to further modify the input device taught by *Armstrong* with the teachings of *Blonder* and *Toyoda et al* in order to form an input device in which an advertisement or other message can be added to the trackball of the input device.

13. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Armstrong (US 5,565,891) and Nippoldt (US 4,952,919) as applied to claim 9 above, and further in view of Bruneau et al (US 6,707,443).

Regarding claim 10, *Armstrong* as modified above discloses a data registration device per Claim 9.

Armstrong as modified above fails to teach a data registration device wherein the motion sensors are optical sensors that sample a surface of the operating ball and its rotation.

Bruneau et al discloses a data registration device wherein the motion sensors are optical sensors that sample a surface of the operating ball and its rotation (Column 6, lines 31-39 discloses that optical sensors are used to determine movement of a sphere 15 in a trackball input device.).

Therefore it would have been obvious to one of ordinary skill in the art at the time that the invention was made that using an optical sensing means to sense the movement of a trackball as taught by *Bruneau et al* could be substituted for the encoder sensing means to sense the movement of a trackball as taught by *Armstrong* as modified above.

14. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Armstrong (US 5,565,891) and Nippoldt (US 4,952,919) as applied to claim 1 above, and further in view of Keyson (US 5,784,052).

Regarding claim 11, *Armstrong* as modified above discloses a data registration device per Claim 1.

, *Armstrong* as modified above fails to teach a data registration device further comprising additional actuators that oppose or reinforce a varying force in reaction to control signals from the user resulting from displacement of the retainer element or rotation of the operating ball.

Keyson discloses a data registration device further comprising additional actuators that oppose or reinforce a varying force in reaction to control signals from the user resulting from displacement of the retainer element or rotation of the operating ball (Column 5, lines 48-63 having an having an electrical DC motor which is used to apply tactile feedback to the user in response to the user moving the input device. Figure 2, Column 5, lines 48-63, and Column 6, lines 26-60 of *Keyson* disclose that sensor means 110 and 114 detect the user movement of a rotatable member 108 and send that to a PC 102. PC 102 then generates control signals that are sent to a first drive means 116 and a second drive means 120, where the drive means comprise electric DC motors, said control signals cause the first and second drive means to positive and/or negative torques to the rotatable member 108 being operated by the user to provide tactile feedback to the user.).

Therefore it would have been obvious to one of ordinary skill in the art at the time that the invention was made to further modify the input device taught by *Armstrong* with the teachings of *Keyson* in order to form an input device in which cursor positioning times and positioning inaccuracies are reduced significantly.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **STEPHEN A. BRAY** whose telephone number is (571)270-7124. The examiner can normally be reached on Monday - Friday, 9:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **AMR AWAD** can be reached on (571)272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/STEPHEN A BRAY/
Examiner, Art Unit 2629

/Amr Awad/
Supervisory Patent Examiner, Art Unit 2629

30 January 2010